

Highlights

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Washington SCIENCE TRENDS

ATOMIC ENERGY COMMISSION officials are reliably reported to be discussing possible commercial sale of AEC services in the "Plowshare" program of non-military nuclear explosions. It is believed that special legislation will be necessary to permit private industry to participate in future projects.

The commission is going ahead rapidly with its studies of the possibility of excavating a harbor in Northwest Alaska during 1960. Detailed cost estimates, physical and economic data and an evaluation of safety factors are now being assembled at AEC headquarters and at the Livermore, Calif. laboratories. Prototype devices are in the design and development stage.

COMMISSION OFFICIALS have reason to believe that industry would be interested in paying fees for nuclear explosion services in connection with possible power production, isotope production, recovery of oil from oil shales, tarsands and depleted wells and for the breaking up of underground deposits of low-grade ore for mining.

Duplication geologic processes through controlled nuclear explosions also interests officials of the government's Geological Survey, who point out that such tests would eliminate the "scaling down" problems of laboratory studies. It is believed that a "Plowshare" experiment could duplicate natural ore-forming processes or perhaps create new ore deposits. More reliable surveys of deep crustal structures could also be made through the earthquake effect of controlled explosions. These could be traced as a single sharp pulse at a single predetermined point, and at a precisely known time.

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ATOMIC NOTEBOOK: U.S. technical experts here are not particularly impressed with the Russian announcement of a new 100,000 KW reactor in Siberia. They describe the plant as "basically a scale-up" of the Soviet's only other operating power reactor, a 5,000 KW plant first announced in 1955...They are more interested in Russian claims that super-heated steam will be used in a water reactor to temperatures almost twice those in similar U.S. devices...Interest is also being shown in a superior type of Niobium-Zirconium alloy said to have been developed for use in the mammoth Soviet nuclear icebreaker, the Lenin. Further Russian announcements on the ship expected this month.

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SUBMERSIBLE TANKER capable of sub-polar transit now in the design study stage at General Dynamic's Electric Boat Division. Maritime Administration officials hope to ask Congress to authorize construction of a 20,000 ton, 20 knot vessel. Strangely, they admit they haven't yet discussed the project with the U.S. Navy, and they have no idea what cargoes could economically be carried under the Polar Cap, now or in the future. One major problem: A tanker large enough to be commercially feasible would probably be too big to enter most of the world's harbors. Meanwhile, plans are being drawn up for congressional approval of commercial nuclear surface tankers and other merchant ships.

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DEMAND FOR ENGINEERS has picked up considerably in recent weeks, partly as a result of expanding missile production. Labor Department officials say they know of more than 4,000 positions available -- some 1400 more than in July, but well below the 6,475 openings reported to the government at this time two years ago. The greatest demand is for electrical and mechanical engineers, specialities needed by the missile industry. But there were also many openings for civil engineers, "scientists" and other professionals. Salaries in some cases ranged as high as \$20,000 per year.

Can demand continue? The Aircraft Industries Association says that actual cash outlay for aircraft and missiles by the Defense Department in the next fiscal year will be about \$30 million less than it has been in Fiscal Year 1958. New orders from the Pentagon for such weapons will also decline. However, industry may find some consolation in the fact that the armed services will be putting more cash and more new orders into effect for research and development programs.

PENTAGON SOURCES believe there will be a trend away from heavy weapon programs and increased emphasis on research and development projects linked with "limited" warfare. This means more stress on logistics, troop transport, helicopters and vertical or short take-off aircraft. It also means more money for detection and reconnaissance systems.

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SCIENCE BOOKS will go to the nation's senior high schools on a rotating basis under a new \$500,000 grant by the National Science Foundation to the American Association for the Advancement of Science. The AAAS hopes to publish soon a comprehensive list of science and mathematics books for schools and libraries....The Foundation is interested in proposals from universities and colleges for after-school-hours training for high school science and math teachers. The Foundation is ready to cover all tuition and fees, plus other direct costs and travel expenses.

MILITARY-CIVILIAN SPACE EXPERTS have in effect issued a new challenge to industrial, academic and government laboratories to help solve some of the "blue sky" logistics problems of future space flight. Here are a few of the major research and development problems and opportunities as outlined before a symposium in Washington, just concluded:

*an aural, and if possible, visual communication system, including two-way radio, space to ground TV and a telemetering system which can monitor biological functions.

*Oxygen containers with a low ratio of container to contents weight and an ability to survive in the space environment.

*A lightweight, comfortable metallic cloth suit to be worn by pilots and crew. It would be designed in conjunction with a special electromagnetic seat which could hold a man when turned on, or permit him to "float" about when turned off.

*Stepped-up studies of the properties of materials in a very high vacuum. Under such conditions, it was reported, dry metals tend to form cold welds when subjected to impact, rubber hardens and becomes brittle, many plastics volatilize and normal oil, grease and graphite fail to function.

DUAL PURPOSE DESIGNS for space equipment are suggested by Dr. Otto H. Schmitt, University of Minnesota. Among his suggestions; edible food containers and a workable system to produce algae for food and air purification. He also suggests further studies of the unique properties of proteins, which provide food and possible structural uses.

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SPACE NOTEBOOK: The Air Force has been hoping to have President fly to California for ceremonies marking the "roll-out" of the first X-15, scheduled for Oct. 15. ..Failure of the last Vanguard has been tentatively traced to a malfunction in the second stage...Air Force emphasis on space projects highlighted by creation of Military Space Systems office, Inglewood, Calif., which now has equal status with Ballistic Missile Systems office...The Lunar Probe vehicle slated for launching next weekend will carry a sterilized payload to prevent possible "contamination" of the moon's atmosphere.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION may run into difficulty in recruiting Naval Research Laboratory scientists, many of whom are being asked to join the new agency as a "team." Loyalty to Dr. John P. Hagen, who will join NASA will help. The "bait" may also be a chance to design future spacecraft and the lure of eventual higher pay...NASA will take over scientific satellites, lunar probes and basic research on nuclear rockets, fluorine engines and the million pound thrust, single chamber engine project.

() Uranium Isotopic Standards are being made available for use by educational and research institutions and industry in the U.S. and abroad. Charges will vary from about \$18 to \$40 per unit. (Write Atomic Energy Commission, Washington, 25, D.C.)

() Mechanical properties of ceramics can be studied with improved reliability through research sponsored by U.S. Army. The work is expected to lead to temperature-stable cermet in rockets and missiles. (Write National Bureau of Standards, Office of Technical Information, Washington, 25, D.C.)

() High-temperature refractories for use in rockets are surveyed in a 1955 publication now released for industry use. 55 pages, \$1.50. (Write OTS, U.S. Department of Commerce, Washington, 25, D.C. for report PB 131503)

() Rapid detection of acetylene for air pollution control has been developed in cooperation with U.S. Public Health Service. Minute quantities can be measured with a new, simple and portable device. (Write National Bureau of Standards, Office of Technical Information, Washington, 25, D.C.)

() Reconnaissance equipment for space vehicles can be tested for reliability with a new dynamic analyzer developed at Wright Field. The device can simulate altitudes up to 100 miles in addition to ground haze, and radio transmission interference. The analyzer is planned for camera systems and will ultimately be adapted for electronic and infrared reconnaissance. (Write ARDC Information Office, Andrews Air Force Base, Washington, 25, D.C.)

() Audio signals as warning indicators for weapons systems are evaluated in an Air Force research report available to industry. 27 pages, 75¢ (Write U.S. Dept. of Commerce, Washington, 25, D.C. for report PB 131442)

() Comprehensive Zirconium bibliography abstracts 844 technical reports and 62 patents. Free. (Write Bureau of Mines, 4800 Forbes Ave., Pitt., 13, Pa. for Inf. Circ. 7771 and 7830.)

() Chemical and Petroleum plant operating costs are described in bibliography listing more than 500 articles and publications. Free. (Write Bureau of Mines, 4800 Forbes Ave., Pitt., 13 Pa. for Inf. Circ. 7847.)

() Tidal Current Tables for the Pacific coast of North America and Asia provide useful information for engineers engaged in maintenance and improvement of channels and harbors, in marine construction and in sewage disposal, as well as navigation. 238 pages, 50¢ (Write U. S. Coast and Geodetic Survey, Washington 25, D.C.)

() AEC Invitation for proposals from industry and research and educational institutions for performance of test irradiation services is now available. Free. (Write Director, Division of Reactor Development, U.S. Atomic Energy Commission, Washington, 25, D.C.)

